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TO : C.B. EATON

DATE: July 30, 1958

FROM : B.E. WICKMAN

SUBJECT: RX-CAL-INSECT SURVEY PROGRAM, Report, Yosemite NP
Mountain Pine Beetle Control

Direct control of the mountain pine beetle began in Dingley Creek, Yosemite National Park on June 18. Prior to control action I conferred with John Mahoney, park forester and Bill Sabo, control foreman at Tuolumne Meadows on June 17. At that time the boundaries of the infestation were discussed and a plan of action was formulated.

Boundary delineation

It was decided to divide the infested area into 5 blocks starting with A, approximately 600 acres, northwest of the Young Lake trail (see map). Then Block B between the trail and Dingley Creek another 600 acres. Block C would contain about 600 acres from Dingley Creek southeast to the ridge above Delaney Creek. At this point a base line running N45°E. from the Young Lake trail to the Dog Lake-Young Lake trail would be established with a string line. Block D would extend from this base line to Delaney Creek, another 600 acres.

The last area, control Block E, would extend from Delaney Creek to the Mount Diablo meridian between T1N. and T1S. as mapped (actually this line is in error on maps) and would contain 300 acres.

I strung the entire boundary of the infestation and the base line except for Block A and E on June 18 and 19. Trails were used for boundary lines on the northwest side and east side of the infestation. Blocks B and C were then strung at 3-chain intervals up slope or down slope, for ease of stringing, spotting and mapping. These spotting lanes were run at 45°, NW to SE, to fit the two drainages.

A six-man blister rust crew was used for stringing Blocks B, C and D on June 21 and 22. Blister rust tags were put on the odd-numbered lines every 5 chains showing block, line number, and 5-chain intervals from starting point.

Treating Crew and Methods Used

A 7-man treating crew under Bill Sabo started work on Block A on June 18. They planned to proceed to Block B, the most heavily infested area, then to Blocks C, D and E in that order.

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By June 19 the treating crew was in Block B and by June 21 the crew had increased to twenty men. They were divided into three sets of fallers, three sets of treaters, two packers transporting the insecticide with mules. Most of the spotting was done by Sabo. The crew worked a 9-hour day, 7 days a week.

All infested lodgepole was treated by falling, bucking, and applying EDB in water emulsion with a garden sprinkling can on the top of the log, then rolling the log and applying the EDB until the entire infested portion was well saturated.

The control crew operated as follows: The spotter (I helped with the spotting on June 21 and 26) walked the string lines marking infested trees with an orange or silver stripe breast high and a number. He then took d.b.h., and kept a list of these by tree number. The tree was next referenced to the nearest string line and tag and mapped for the treating crew's use. The fallers were very close behind the spotters. They averaged about 8 trees per crew per day. The fallers felled the tree, limbed it and bucked it into rollable lengths as far up the trunk as brood could be found (all of the straw bosses and fallers had experience in insect control.) The insecticide applicators followed up several hours to a day later. The packer established a supply dump each day in the treating area near a good water supply and left the EDB concentrate in five gallon tins. The crew then mixed the EDB with water in empty 5 gallon tins and carried it to nearby trees ready for treatment. The insecticide was applied with a sprinkling can after the log was rolled by a team with peavies. This was the most difficult phase of treating. The largest tree treated had a diameter of 62 inches and the average was about 30 inches. Infested log lengths varied from 10 to 45 feet with an average of 25 feet. As many as six men with peavies were needed to roll some logs. The straw boss then recorded the tree number and infested length on a treating tag. About 25 trees a day were treated. The crews started in the lower elevations in the south and proceeded north up Dingley Creek as the snow melted. A total of 448 trees comprising 330,250 board-feet were treated with 3,418 gallons of spray. The cost per tree was \$23.50.

Biological Observations

Some interesting biological conditions were found both in the insect broods and the dying lodgepole pine. An estimated 40 percent of the dead lodgepole pine checked in the control area had sour sap or fermented phloem. Of these, roughly half had been attacked by mountain pine beetle and had long adult galleries but no sign of larvae or larval galleries. A few of these trees had several live larvae in them. Other attacked trees had very tight dry bark and phloem with long adult galleries again, but none or few larval galleries. Many infested trees were only strip

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killed with Ips filling in on the thin barked side of the tree. The infested strips usually contained good broods of larvae and pupae. Overwintering adult beetles could be found quite easily in many infested trees. Most of the infested trees were also found near little streams.

Groups of infested trees with vigorous attacks all the way around the trunk were not found in groups until June 26, just north of the upper part of Dingley Creek. Seventy trees were found on about 60 acres. This area appears to be new infestation and was not treated by previous control efforts in Dingley Creek during 1956 and 1957. From observations it appears that this concentration is moving up slope in a north-easterly direction. Thus it will run out of trees in about one-half mile when the terrain changes to bare rock.

On June 25 Trostle and I sampled a five chain strip 100 chains long from Delaney Creek to Dingley Creek through the middle of the infested area. We found approximately .35 infested trees per acre, mostly with strip kills. We also found .25 dead lodgepole per acre with sour sap. Most of these trees had adult galleries, but few or no successful larvae. Because of these conditions, treatment of this area was given low priority.

On July 3 the last infested trees in Block B were treated. They totaled 448 trees treated on 600 acres. Because of the scattered nature of the infestation, the poor insect broods in Blocks C,D, and E and short amount of time left before new attacks would begin, the project was terminated with the completion of Block B.

I made a final examination of the treated area on July 9. In four hours of checking I found 6 trees missed by the treating crews. Considering the difficulty of spotting in early summer this indicated that few trees were left untreated. Some freshly attacked trees were also found in the midst of treated groups.

The infestation boundary was checked at this time and 3 infested trees were found on the trail between Dingley Creek and Delaney Creek. One infested tree was found halfway between Delaney Creek and Dog Lake.

Twenty acres in the heaviest part of the infestation on Dingley Creek was sampled for "sour sap" trees on July 9. On the twenty acres 23 infested trees were treated and 16 "sour sap" trees were dead and untreated. All but 2 of the sour sap trees had some evidence of attack by mountain pine beetle.

Mortality Checks of Treating

Mortality checks in treated logs were made periodically. The first, on June 24 found complete kill under 10, six square inch bark areas

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on all sides of 6 logs that had been treated on June 19. On June 25 Trostle and I found dead larvae on the tops and some live larvae on the sides and bottoms of 5 logs that had been treated on June 22. Three logs treated on June 25 had all dead in top samples and some alive on side samples taken the next day, June 26. Checks made on July 1 of 6 trees treated on June 30 found dead larvae, pupae and adults in all but the lower side of one log.

The final checks of 15 treated trees were made on July 9. The trees had been treated 7-10 days previously and had almost 100 percent killed the broods.

Recommendations

In late summer of 1958 the 2,700 acres of infestation should be examined by appraisal survey. If at that time group kill of lodgepole pine by the mountain pine beetle is still occurring, then plans should be made for a fall control program to clean up the most critical areas.

I think in the future we should limit our technical aid to purely entomological duties. For instance I was forced into a position of intermediary between the park forester and foreman of the treating crew. This sort of thing should be avoided. Another responsibility that should not be ours is stringing the infested area. Once we delineate the boundaries on a map our work in that phase should cease. Here I had to take full responsibility for stringing, doing much of it myself, because the Park assumed it was our job. The control lanes were strung in a very feasible manner for the terrain but they did not satisfy the control foreman. Also, though spotting training was volunteered, no effort was made to train additional spotters beyond the control foreman. I spent two days helping him spot trees so that he could keep ahead of the treating crews. Several times he had to stop the fallers and use them as spotters. Our position on these duties should be made clear before the program starts.

Summary

From June 18 to July 3, 600 acres of lodgepole pine in the Dingley Creek area of Yosemite National Park was treated for mountain pine beetle by felling and spraying with water emulsion of EDB. Four hundred and forty-eight trees were treated in this manner. Only Blocks A and B were treated as they had the most serious concentrations of infested trees. The insect broods throughout the infestation were generally weak with many trees having evidence of unsuccessful brood establishment.

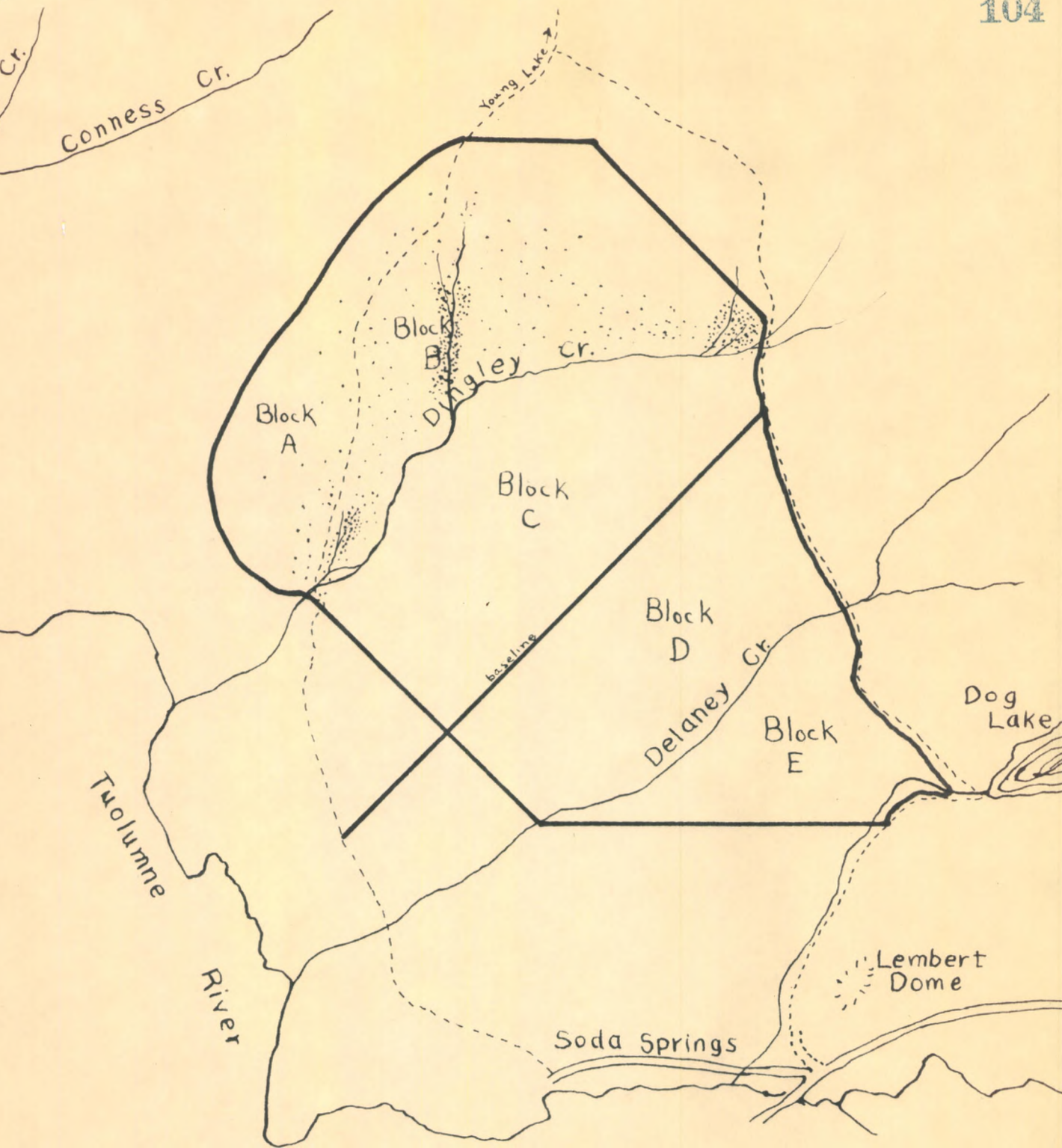
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However, because of the large numbers of weakened trees highly susceptible to mountain pine beetle attack, it is recommended that the area be surveyed again in late summer and control action taken during the fall on any group kills or heavy concentrations of infested trees that could produce heavy mountain pine beetle populations. Also our duties for technical aid should be made clear to all personnel concerned prior to the control program.

Boyd E. Wickman

cc: R.C. Hall
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DR BEAN w/PICTURES



Tuolumne Meadows
Yosemite National Park
Mountain Pine Beetle
Control

June - July, 1958

⊙ Treated trees

1/2
Scale 2" = 1 mile

—— Control Boundary